ME-3200 Emulator

INTRUDUCTION

ME-3200 is a real-time in-circuit emulator dedicated to ST uPSD3200 family of microcontrollers. It has the architecture of HOST and POD and is linked to PC via the parallel port(Printer Port). It emulates the microcontroller using either the built-in clock oscillator or external clock source (oscillator on POD or on user's system).The valid clock frequency ranges between 1MHz and 33MHz.

ME-3200 emulator is supported by MedWin, a Windows-based Integrated Development Environment, which supports Source-Level debugging for C, PLM and Assembler, Conditional Breakpoints, real-time tracing, full analysis of Expression, display and alter all kinds of variables and many other features. For detail information about MedWin to see MedWin User's Manual.

FEATURES

- Supports following ST uPSD3200 family of microcontrollers (both package of QFP52 and QFP80)

  uPSD 3212/3212V

  uPSD 3233/3233V

  uPSD 3234/3234V

  uPSD 3253/3253V

  uPSD 3254/3254V

- Supports both 5V and 3.3V microcontrollers.
- Emulates CPLD logic in truth
- 3 choices for system clock
- 288KB Emulation Memory with Paging support
- Standard PSD module of PSD834F2(8K RAM)[1] on board
- Program breakpoints of 3 times size of code memory
- Supports breakpoints on external signal
- The address of CSIOP, SEL0 and SEL1 can be set arbitrarily
- The address of SRAM can be set arbitrarily
- Supports real-time emulation for Watchdog
- Except dynamic using 8 stack bytes before user's SP and adding 24/24/80 more counts to T0/T1/T2, there are no other user's resources occupying
- Protect on ports of power and communication
- More data viewing windows are available due to high speed parallel communication of Printer Port
- JTAG Programmer uPSD LINK[2]

NOTES:

1. PSD834F2(8K RAM) is standard configuration, following optional parts may be purchased through your local distributors:

   PSD834F2V(8K RAM,3.3V)

   PSD854F2(32K RAM,5V)

   PSD854F2V(32K RAM,3.3V)

2. JTAG programmer uPSD LINK is optional, it has following features:

   6 or 4 wires JTAG programming
   2.7V~5.5V operation voltage
   Linked with PC via Printer Port
   Supports PSDsoft Express of ST

PARTS OF ME-3200 EMULATOR

ME-3200 EMULATOR consists of six parts. They are Emulator Probe Assembly, Emulator Host, Cable for connection between Emulator Probe Assembly and Emulator Host, Cable for connection between Emulator Host and PC, JTAG Programmer uPSD LINK(optional) and a Power Adapter. Each part is described as follows:

- Emulator Probe Assembly

  The Probe Assembly consists of tree modules:

  1. Probe of Devices (POD)

     Tree types of POD are provided, they are:

     a. POD **ME-3200-ADP-52,** used to emulate microcontrollers of TQFP 52 package. The user's system should supply a sockets matrix as illustrated in fig 1(inner). The size of matrix is 900×900 mil and the space between pins is 50 mil(1.27mm).

     b. POD **ME-3200-ADP-80,** used to emulate microcontrollers of TQFP 80 package. The user's system should supply a sockets matrix as illustrated in fig 1(outer). The size of the matrix is 1150×1150 mil and the space between pins is 50 mil(1.27mm).

     c. POD **ME-3200-ADP-DK3200**, used in ST DK3200 DDK. It's pins matrix is consistent with sockets matrix on the ST DK3200 DDK.

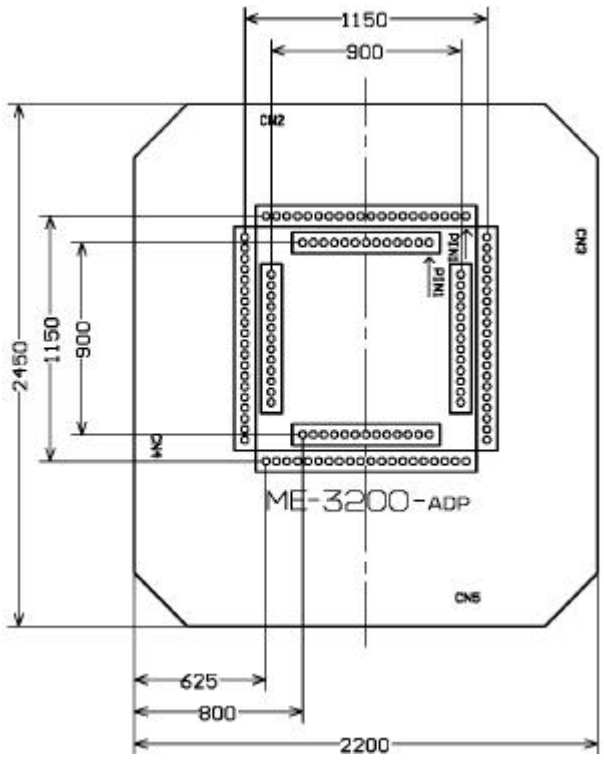
  2. PSD module **ME-3200-PSD** (fig 2)

     PSD module of Emulator Probe Assembly is used to emulate built in PSD circuits of uPSD3200 family microcontrollers.

  3. MCU module **ME-3200-MCU** (fig 3)

     MCU module is a base of Emulator Probe Assembly. The socket of 40 pins on it is for connection with ME-3200 Emulator Host. The selection of clock source for External Clock mode is also on MCU module.

- Emulator Host **ME-3200**
- Cable of Emulator Probe Assembly **FLT40B-4**
  The four inches long cable which connects Emulator Probe Assembly and Emulator Host ensures reliable communication up to 33MHz system clock.
- Cable of Emulator Host **CAB25DB**
  This 25 wires cable is for high speed communication either between Emulator Host and PC or between JTAG Programmer uPSD LINK and PC.
- JTAG Programmer uPSD LINK (optional)
  It is optional and used to program all memory blocks(primary and secondary Flash memory), PLD logic, and PSD MODULE Configuration Register Bits of ST uPSD3200 family of microcontrollers through JITAG interface.
- Power Adapter **MS-100-AC220-DC9V/850mA**
  This module Supplys 9V DC power for Emulator Host and Emulator Probe Assembly. It also powers uPSD LINK when programming the device through JITAG interface.



pig1. Adaptor

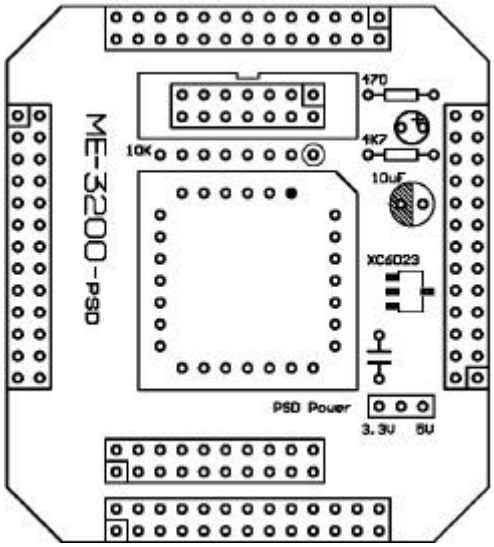


fig2. ME-3200-PSD

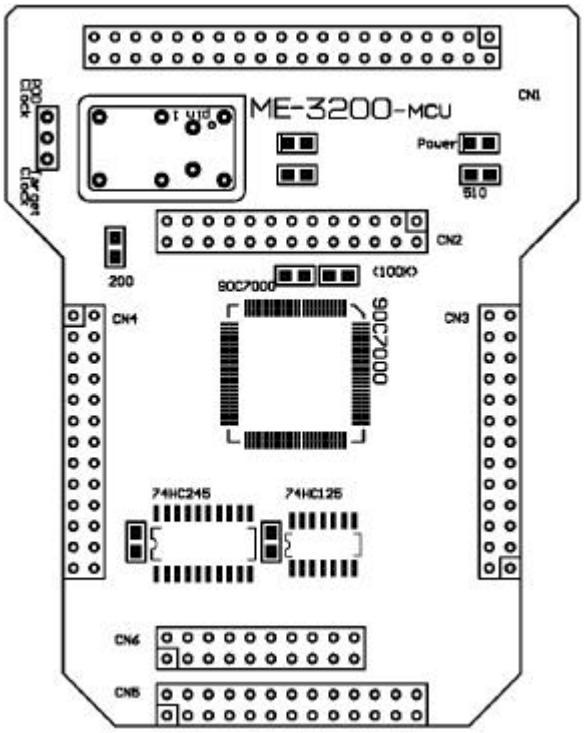


fig3. ME-3200-MCU

DETERMINING EXTERNAL CLOCK

ME-3200 EMULATOR has three choices for system clock, they are internal 12MHz , internal 24MHz and external oscillator, When external mode is chosen, the determining of clock source is made on the MCU module(**ME-3200-MCU**). As illustrated in fig 3, there is a jumper on the up-left of MCU module, to make selection as follows:

- When the jumper is put on the position POD Clock, the clock is created on MCU module. There are tow ways to create clock:
  1. Plug a two legs crystal of suitable frequency into the small oscillator PCB on MCU module. The system clock is created by this two legs crystal.
  2. Take off the small oscillator PCB carefully and replace it with a four legs active crystal module. Pay attention to the pin mark on MCU module to avoid misplugging. In this case the clock comes from four legs active crystal.

- When the jumper is put on the position Target Clock, the clock source on user's system is chosen as system clock. The user must provide a stable clock out.

VOLTAGE SELECTION OF PSD MODULE

There is a jumper for voltage selection on PSD module (**ME-3200-PSD**).

- If PSD chip is PSD8x4F, put the jumper to position 5V.
- If PSD chip is PSD8x4FV, put the jumper to position 3.3V.

CONNECTION OF ME-3200 EMULATOR

After choosing right POD according to user's application, the parts connection of ME-3200 Emulator can be made as follows:

- Put PSD module **ME-3200-PSD** onto MCU module **ME-3200-MCU** in a piggyback way. Align plug pins and sockets on two modules and make they join together tightly.
- Put the chosen POD module under the MCU module **ME-3200-MCU** in a piggyback way. Align plug pins and sockets on two modules and make they join together tightly.
- Connect the Base, MCU module **ME-3200-MCU,** and Emulator Host with 40 wires flat cable (**FLT40B-4**).
- Plug one end of 25 wires cable (**CAB25DB**) into Printer Port of PC and fasten it by two fitting screws on the plug.
- If to program PSD, connect JITAG Programmer uPSD LINK and PSD module(**ME-3200-PSD**) with 14 wires flat cable supplied with uPSD LINK. Then plug another end of 25 wires cable (**CAB25DB**) into DB25 socket of uPSD LINK.
- If to emulate 8052, disconnecte all connection of uPSD LINK**,** and plug another end of 25 wires cable (**CAB25DB**) into DB25 socket of Emulator Host.
- Plug Power Adapter (**MS-100-AC220-DC9V/850mA**) to the socket of city power, then insert 9V DC out plug of Adapter into DC jack of Emulator Host.

USING ME-3200 EMULATOR

There are tow phases during the development of ST uPSD3200 family of microcontroller. Trey are designing and programming PSD module of uPSD3200 and emulating 8052 microcontroller within uPSD3200. Before start the second phase, the user must complete the first phase successfully.

- The procedures of phase 1 to program PSD module are shown as follows:
  1. Set the voltage selection jumper on PSD module correctly according to user's application.
  2. Connect uPSD LINK to Printer Port of PC using 25 wires cable (**CAB25DB**).
  3. Connect JTAG Port of uPSD LINK to the same port on PSD module of Emulator Probe Assembly using 14 wires cable supplied with uPSD LINK.
  4. Plug Power Adapter into the socket of city power, then insert 9V DC out plug of Adapter into DC jack of Emulator Host. Emulator Host is also responsible to power Emulator Probe Assembly and JTAG Programmer uPSD LINK**.**
  5. Design and program PSD chip on ME_3200-PSD module using **PSDsoft** which is a Windows-based software development tool. The design for PSD module can be quickly and easily produced in a point and click environment

NOTE:

User only need to design and program PLD logic (DPLD and CPLD) and PSD MODULE Configuration Register Bits, and leave Flash Memory unprogrammed(primary and secondary Flash memory) blanked. Because during the emulating all user's codes in Flash Memory are mapped to Emulating RAM of Emulator Host.

- The phase 2 of to emulate 8052 in-circuit is described as follows:
  1. Remove 9V DC plug from Emulator Host and disconnect all the connection of the uPSD LINK.
  2. Connect Emulator Host with PC using the 25 wires cable(**CAB25DB**).
  3. Power Emulator Host again.
  4. Run MedWin Integrated Development Environment and open dialog box of option|Emulator, set the right parameters of ME-3200.
  5. Emulate the application program until the all program lines are executed successfully.

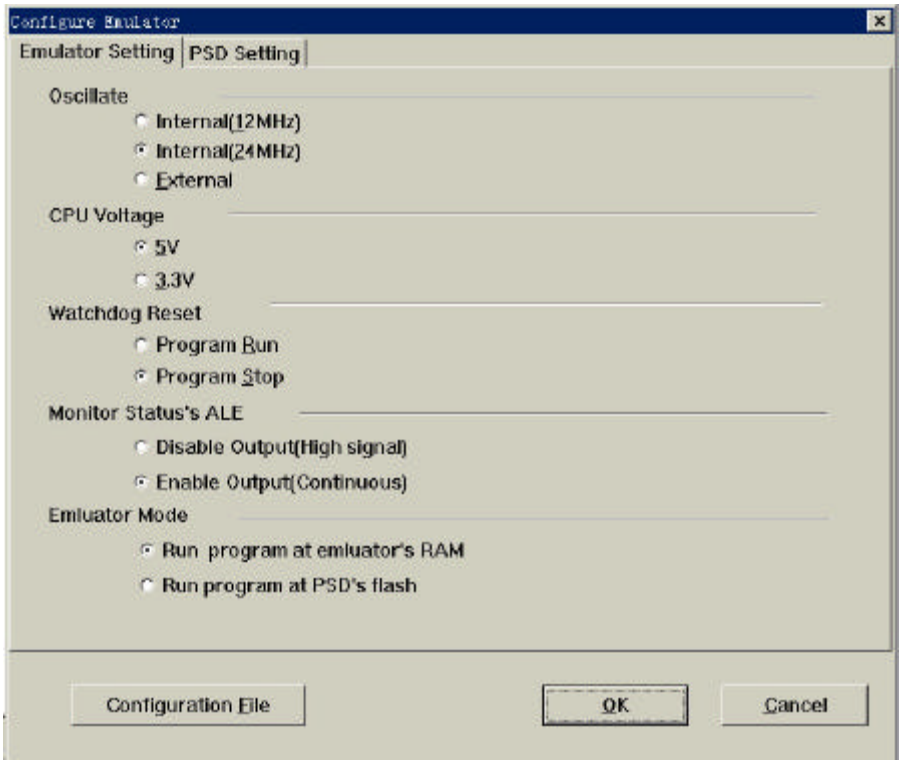
NOTE:

If PSD design has to be modified during the phase 2, the procedures of phase 1 must be repeated.

SETING ME-3200 EMULATOR UUDER MedWin

Before to emulate the 8052 application program under MedWin, the parameters for ME-3200 Emulator must be set first.

- Choose Emulator command from options menu, a Emulator dialog box of two pages is popped out. The first page displayed is Emulator Setting, shown as follows:

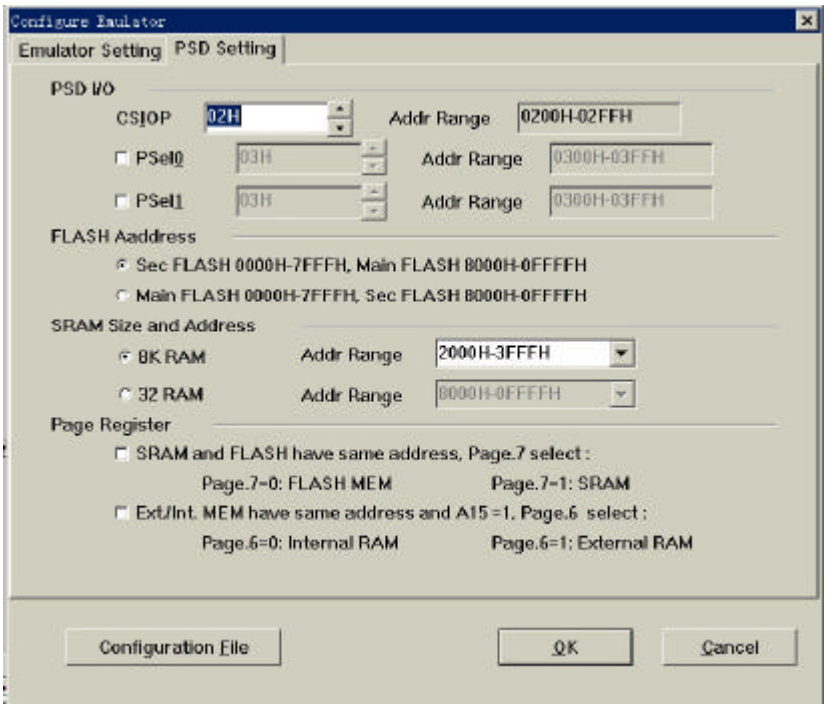


The user should choose right parameters according to his application.

NOTES:

1. When choose option external of the title oscillator, the oscillator to be used is determined by the hardware setting on MCU module of Emulator Probe Assembly.
2. The ALE output of the 8052 can be set as constant high level or continuous pulse. The latter is useful to users who use ALE as a clock.

- The second page of Emulator dialog box is PSD Setting, shown as follows:



NOTES:

1. The value of CSIOP should be same as the value when PSD module hardware is designed, otherwise ME-3200 Emulator will not be able to access I/O ports and SRAM of PSD module within uPSD3200. The default is 02H when emulators leave factory.
2. Set the value of PSel0 and PSel1 according to user' s hardware design.
3. The size of internal SRAM of PSD must be consistent with device to be emulated. For example, choose 8K SRAM for PSD834 and 32K SRAM for PSD854. The address range should be same as that when PSD module hardware is designed.
4. In ME-3200 Emulator, Bit0 to bit4 of Page Register are used as page selection while bit7 and bit6 are used as control of Internal/External memory selection.
5. Configuration file